

REMARKS

Claims 1-10 are currently pending in the patent application. For the reasons and arguments set forth below, Applicant respectfully submits that the claimed invention is allowable over the cited references.

The instant Office Action dated August 17, 2007 objected to claims 1, 5 and 6 due to typographical errors and listed the following rejections: claims 1-3 and 5-10 stand rejected under 35 U.S.C. 103(a) over Hueting *et al.* (U.S. Patent No. 6,515,348) in view of Dennen (U.S. Patent No. 6,555, 872); and claim 4 stands rejected under 35 U.S.C. 103(a) over Hueting '348 in view of Dennen and further in view of Hueting *et al.* (U.S. Patent No. 6,534,823).

Regarding the objection to claims 1, 5 and 6, Applicant has amended these claims to correct the typographic errors.

Applicant respectfully traverses the Section 103(a) rejection of claims 1-3 and 5-10 because the cited combination does not correspond to the claimed invention which includes, for example, aspects directed to the source and drain implantations including conductive shallow contact regions. The Office Action acknowledges that the Hueting '348 reference fails to teach these aspects of the claimed invention. *See, e.g.*, the bottom of page 3 of the instant Office Action. In an attempt to address these deficiencies, the Office Action cites to Dennen's source and drain regions (123 and 124). *See, e.g.*, Figure 9. However, as is apparent from Dennen's use of the terms source and drain regions, the cited portions of Dennen do not teach that regions 123 and 124 are conductive shallow contact regions of source and drain implantations. Instead, Dennen teaches that regions 123 and 124 are source and drain regions. *See, e.g.*, Figure 9 and Col. 26:38-39. Thus the cited portions of the Dennen reference do not teach source and drain implantations that have conductive shallow contact regions, let alone that the conductive shallow contact regions extend to a depth of no more than 35% of the depth of the trench as in the claimed invention.

Regarding the Office Action's assertion that Applicant has not established the criticality of the ratio of the depth of the shallow contact regions to the depth of the trench, Applicant notes that the Examiner must first present a *prima facie* case of

obviousness before Applicant need show the criticality of a claimed range. *See, e.g.*, M.P.E.P. § 2144.05 (“In the case where the claimed ranges “overlap or lie inside ranges disclosed by the prior art” a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976)”). In this instance, the Office Action has not presented a *prima facie* case of obviousness because the cited references do not teach conductive shallow contact regions as discussed above.

In view of the above, the Section 103(a) rejection of claims 1-3 and 5-10 is improper and Applicant requests that it be withdrawn.

Applicant further traverses the Section 103(a) rejection of claims 1-3 and 5-10 because the Office Action has provided no evidence of motivation to combine the Hueting ‘348 and Dennen references. This approach is contrary to the requirements of Section 103 and relevant law. “A patent composed of several elements is not proved obvious merely by demonstrating that each element was, independently, known in the prior art.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (U.S. 2007). The Office Action asserts that one of skill in the art would combine the cited teachings of Hueting ‘348 and Dennen “for the benefit of maximizing the breakdown voltage of trench gate Fermi-FET transistors.” *See* page 4:8-9 of the instant Office Action. However, the cited portions of Dennen teach that the source and drain regions (123 and 124) can be made shallow enough to allow a region of low concentration N silicon to exist above the junction between the tub 122 and well 123. *See, e.g.*, Figure 9 and Col. 26:38-41. As is shown in Figure 9 (reproduced below), the Hueting ‘348 reference does not have a structure that corresponds to Dennen’s tub 122, thus, Hueting ‘348 would not benefit from the teachings of Dennen as asserted by the Office Action.

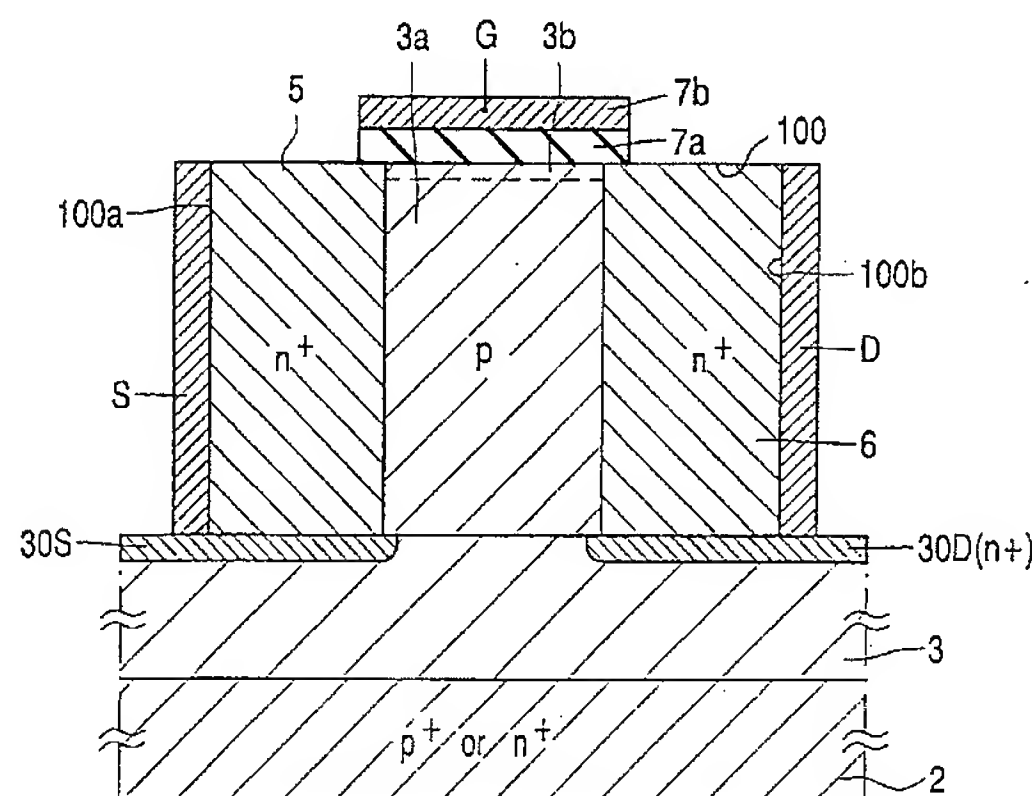


Figure 9 Hueting ‘348

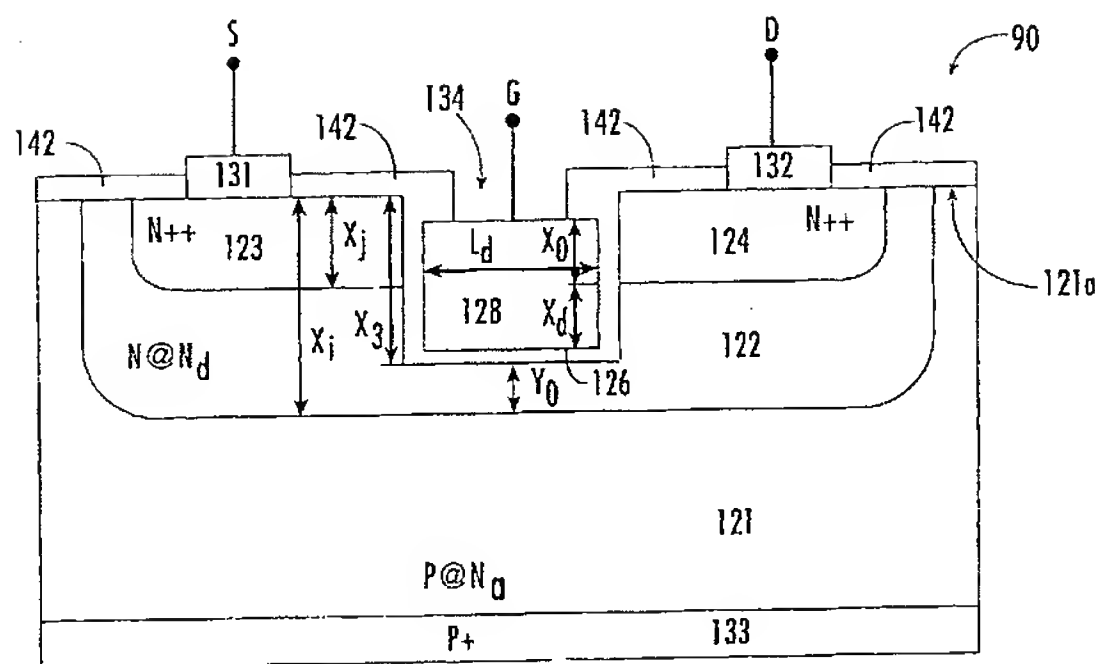


Figure 9 Dennen

Moreover, as is shown in Figure 9 of the Hueting '348 reference, the source and drain electrodes S and D are provided so as to make ohmic contact with the source and drain regions 5 and 6 respectively, over the whole depth of the mesa structure. *See, e.g.*, Col. 6:61-64. As such, there would be no motivation for one of skill in the art to add conductive shallow contact regions to the mesa structure taught by Hueting '348 since the source and drain electrodes make contact over the entire depth of the source and drain regions 4 and 5. In addition, as discussed above, the Dennen reference teaches source and drain regions (123 and 124); Dennen does not teach source and drain implantations that have conductive shallow contact regions as asserted by the Office Action. Thus, the cited teaching of Dennen would not motivate one of skill in the art to combine conductive shallow contact regions with the Hueting '348 reference. Applicant submits that the Office Action appears to be improperly resorting to hindsight reconstruction based upon Applicant's disclosure in an attempt to arrive at a combination that corresponds to the claimed invention. *See, e.g.*, M.P.E.P. § 2142.

In view of the above, the Office Action has not provided any evidence as to why one of skill in the art would find the asserted combination obvious as required. Thus, the Section 103(a) rejection of claims 1-3 and 5-10 is improper and Applicant requests that it be withdrawn.

Applicant respectfully traverses the Section 103(a) rejection of claim 4 because the cited combination of the Hueting '348 and Dennen references does not correspond to the claimed invention as discussed above in relation to the Section 103(a) rejection of claim 1. In at least this regard, the Section 103(a) rejection of claim 4 is improper since claim 4 depends from claim 1. Accordingly, Applicant requests that the Section 103(a) rejection of claim 4 be withdrawn.

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilski, of NXP Corporation at (408) 474-9063 (or the undersigned).

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